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# Low grade mucoepidermoid tumor of Parotid gland presenting as focal asymmetry in the follow-up Radioiodine scan in a patient of differentiated papillary carcinoma of thyroid

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# Low grade mucoepidermoid tumor of Parotid gland presenting as focal asymmetry in the follow-up Radioiodine scan in a patient of differentiated papillary carcinoma of thyroid

#### Abstract:

Low grade mucoepidermoid tumor of the right parotid gland presenting as focal uptake in the follow-up whole body iodine scan in a patient of differentiated papillary carcinoma of thyroid 1 year after successful ablation is presented in this report. Following surgical excision, the histopathology was proven. The illustrated case represents false positive focal accumulation of <sup>131</sup>I in low grade mucoepidermoid carcinoma of the salivary gland that arose early in the followup course in differentiated thyroid carcinoma post-radioiodine (RAI). However, the latency period until salivary gland tumor development seemed somewhat short is a factor that doubts the causal relationship with RAI treatment. Salivary gland tumours induced by radiation has been reported primarily in the setting of external radiotherapy. In large volume of cases of thyroid carcinoma treated with radioiodine till date in several centres across the world, such occurrence is rare.

#### Introduction:

False positive uptake on whole body iodine scan in patients of differentiated papillary carcinoma of thyroid can result from unrelated etiopathologies and should be evaluated thoroughly. Radioactive iodine ablation in differentiated papillary carcinoma of thyroid has few acute and chronic complications. Most common early complication is sialadenitis (*1-2*). The salivary glands have high selectivity to concentrate radioiodine and this iodine secreted into saliva has very high salivary concentration, as high as 20 to 100 times that serum concentration (*3*). Epithelium of intralobular ducts is the primary site of iodine transport into saliva (*4-5*). Periductal capillaries and ductal epithelium helps to extract and concentrate iodine respectively. Approximately 24% of administered 1311 activity is lost in the salivary secretion during each cycle of radioiodine ablation (*6*).

Few salivary gland neoplasms which have been reported post-radioiodine ablation include mucoepidermoid carcinoma (7), non-hodgkin's lymphoma (8) and pleomorphic adenoma (9). The occurrences of these neoplasms though rare, are thought to be proportional to the dose of 131I administered. To reduce salivary gland damage post RAI (radioactive iodine) therapy, use

of sour candy (2) or lemon juice (10) are advised in clinical routine to increase salivation. Increased salivation reduces both transit time of RAI through parotid and other salivary glands and RAI concentration in salivary glands. Certain cholinergic drugs like pilocarpine or cevimeline are given for 5 days (starting 2 days before, the day of and 2 days after RAI) to decrease transit time through salivary glands. Temporary suspension of anticholinergics in relevant medical scenarios also helpful. Intravenous amifostine (an organic thiophosphate) is a recent addition to this list, which can reduce the effects of radiation to salivary glands post RAI (11).

#### **Case report:**

A 17 years old female initially presented with right sided anterior neck swelling, routine USG findings showed a small hypoechoic lesion in right lobe of thyroid measuring 8.7 x 7.8 mm and multiple right sided neck nodules, largest measuring 3 x 1.6 cm. FNAC of neck nodes showing features suspicious of papillary carcinoma of thyroid and FNAC from right lobe of thyroid demonstrated papillary carcinoma of thyroid. The patient underwent total thyroidectomy with bilateral level II to V neck dissection and bilateral central compartment clearance. The final histopathology was differentiated papillary carcinoma of the thyroid (classical type) with regional nodal metastases, following which patient was referred to our institute for the further management. In view of the above mentioned histopathology and a 24 hours uptake of 2.7 % at pre-treatment diagnostic scan, the patient was treated with 5069 MBq of 1311 therapy. Post-therapy scan showed significant uptake in neck and bilateral symmetrical salivary glands. After 6 months, the patient was called for follow-up whole body iodine scan, which showed uptake in the neck and marginally elevated thyroglobulin. In view of solitary non palpable focus and the patient reluctant to undergo surgical evaluation, she was considered for treatment with 5291 MBq of 1311 and post therapy scan show similar findings as in the previous scan.

The follow-up whole body iodine scan after 1 year showed successful ablation with no suspicious metastatic uptake in neck and normal thyroglobulin, however, asymmetric salivary gland uptake without any clinically discernible lesion at that site (Fig 1A and 1B). The patient was advised for TSH suppression therapy and asked to come for follow-up after 1 year as per the

routine institutional protocol. At this time, she presented with submandibular swelling which corresponded to the focal uptake in the whole body iodine scan undertaken previously. Patient underwent excision of the lesion and pathology was low grade mucoepidermoid tumor.

#### **Discussion:**

Salivary gland tumors induced by radiation has been reported primarily in the setting of external radiotherapy and may be benign or malignant, benign tumors are more common in the form of benign mixed tumor or pleomorphic adenoma and reported malignant ones are mucoepidermoid carcinoma, adenocytic carcinoma, myoepithelial, malignant mixed tumor, adenocarcinoma and acinic cell carcinoma. Modan et al reported 11 and 21.5 years as latent period for development of malignant and benign salivary gland tumors respectively (*12*). In their study, a 4.5-fold incidence of cancer and a 2.6-fold increase of benign tumors was observed (*12*). Few studies reported that incidence of MEC increases with the external radiation dose and vice versa: in one review of literatutre, the most common histopathological type of second malignancy observed in salivary glands was also MEC (*13*).

Mucoepidermoid carcinoma (MEC) of salivary glands arises from pleuripotent reserve cells of excretory ducts, which can show squamous, columnar and mucous differentiation (14). Stewart et al defined the term mucoepidermoid as a tumor with mixed pattern of two main cell types: epidermoid and mucous producing cells (15). Mucoepidermoid tumors are classified in to 1) Low, 2) Intermediate and 3) High grade. The other characteristics of classification of MECs include architectural pattern (cystic vs solid), Cell type (mucous vs epidermoid) and nuclear pleomorphism. Parotid gland is the most commonly involved gland among the salivary glands.

Verma et al (16) reported external radiation and chemotherapy induced salivary gland MEC in 58 patients, out of which most of them were low grade histopathology and localised to parotid gland. They observed shorter latent period in patients treated with combined chemo-radiotherapy versus radiotherapy alone. They reported overall 2 years and 5 years survival rates as 98% and 93.4% respectively (16). Primary treatment of salivary gland neoplasms is surgical resection of primary tumor in low grade pathology and neck dissection should be performed in intermediate and high grade settings. Radiotherapy should be recommended in high grade

pathology and tumors with positive margins. These tumors generally have good prognosis and since low grade MEC is the most common pathology, they have excellent prognosis following complete resection of primary tumor.

Thus, this is a rare observation of salivary gland tumor (MEC) that occurred after radioiodine treatment. It is desirable that follow-up observations be made after RAI treatment with mind that such tumors could arise and is a meaningful report in the sense of caution. However, it should be remembered that the asymmetry of parotid gland accumulation in post-therapy scintigraphy could be due to various reasons and the development of salivary gland tumor is one such cause in this setting.

### **Conclusion:**

Low grade mucoepidermid carcinoma, detected early in the follow-up patient of differentiated thyroid carcinoma post RAI ablation therapy is reported. However, the latency period until salivary gland tumor development seemed somewhat short is a factor that doubts the causal relationship with RAI treatment. Asymmetrical uptake in the parotids on whole body iodine scan following high dose RAI therapy should be evaluated thoroughly to rule out salivary gland neoplasm lurking within.

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# Legend for Figure:

Figure 1A and 1B. 131-Iodine whole body scan (anterior and posterior view respectively) showing asymmetrical focal uptake in right sided parotid gland.

